REMARKS

This Amendment is in response to the Non-Final Office Action mailed on December 18, 2007, for the present application, which has been reviewed. The present amended Claims 1-3, 9, 13, and newly presented Claim 16 considered together with the following remarks, the arguments below and request for reconsideration are believed sufficient to place the application into condition for allowance. No new matter has been added to the application. Claims 4-8, 10-12, and 14-15 have been canceled. Applicants express appreciation for the thoughtful examination by the Examiner.

Claim 1 was amended by incorporating the feature of original Claim 8 and further defining retardations of optically anisotropic member (A) and optically anisotropic member (B) with some editorial amendments. Claim 1 thus amended corresponds to the third embodiment of the present invention and another embodiment in which the polarizer of the incident side in the first embodiment is placed at the side of the back light and the polarizer of the output side in the first embodiment is placed at the side of vision. Support for the amendment of Claim 1 can be found in the specification on page 54, line 23 bridging to page 55, line 11, Fig. 5, page 55, lines 25 to 26 and page 50, line 12 bridging to page 51, line 7, and page 52, line 23 to page 53, line 8.

Claim 9 was amended to change the dependency to preceding claim according to the cancellation of original Claim 8.

New Claim 16 is directed to a liquid crystal display device in which optically anisotropic members (A) and (B) are obtained by stretching a laminate having a layer comprising other materials laminated to both faces of the layer comprising the material having a negative value of intrinsic birefringence via a layer of an adhesive resin. Support for the newly presented Claim 16 can be found in the specification on page 18, lines 4 to 15.

Rejection of Claims 1-15 Under 35 U.S.C. §103 (a) as unpatentable over Itakura et al. (US 7,164,458) Should Be Withdrawn

The present Office Action rejects Claims 1-15 under 35 U.S.C. section §103(a) as obvious over Itakura et al. (US 7,164,458).

Applicants respectfully traverse this rejection and requests favorable reconsideration and withdrawal of this rejection. Further, Applicants submit this rejection is rendered moot by the present submission.

Legal Standard

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however

without a motivation to combine, a rejection based on a prima facie case of obviousness was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

"In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The Supreme Court of the United States has recently held that the teaching, suggestion, motivation test is a valid test for obviousness, but one which cannot be too rigidly applied. See

KSR Int'l Co. v Teleflex Inc., No. 04-1350, slip op. at 11 (U.S. April 30, 2007). The Supreme Court in KSR reaffirmed the Graham factors in the determination of obviousness under 35 U.S.C. § 103(a). The four factual inquiries under Graham are:

(a) determining the scope and contents of the prior art;

(b) ascertaining the differences between the prior art and the claims in issue;

(c) resolving the level of ordinary skill in the pertinent art; and

(d) evaluating evidence of secondary consideration.

Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

The Court in KSR did not totally reject the use of "teaching, suggestion, or motivation" as a factor in the obviousness analysis. Rather, the Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a).

Even so, the Court in KSR rejected a rigid application of the "teaching, suggestion, or motivation" (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.

The United States Patent and Trademark Office published Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc. The Notice sets forth explicit factual findings that an Examiner must articulate to support an obviousness rejection made using

any of these rationales:

1. Combining prior art elements according to known methods to yield predictable results;
2. Simple substitution of one known element for another to obtain predictable results;
3. Use of known technique to improve similar devices (methods, or products) in the same way;
4. Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
5. ''Obvious to try''—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
6. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other arket forces if the variations would have been predictable to one of ordinary skill in the art;
7. Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Applicants submit that the Examiner has not set forth explicit factual findings to support this obviousness rejection.

The Present Invention

The claimed invention is drawn to a liquid crystal display device of an in-plane switching mode comprising a pair of defined polarizers, wherein the liquid crystal display device is in a defined configuration with an in-plane retardation satisfies a recited formula.

Distinctions over the cited art

Applicants submit the liquid crystal display device of the present Claim 1 has one of the following configurations:[1]

Configuration (1)

PI/ANISOTROPIC(A)/LCC/ANISOTROPIC(B)/PO or

PI/ANISOTROPIC(B)/LCC/ANISOTROPIC(A)/PO,

wherein

(i) ABSNAX of PO and the IPSAX of the LC of LCC under application of no voltage are parallel to each other,

(ii) IPSAX of ANISOTROPIC(A) and IPSAX of ANISOTROPIC (B) are approximately perpendicular to each other,

(iii) IPSAX of ANISOTROPIC(A) and ABSNAX of PO or PI which is disposed closer to ANISOTROPIC(A) are approximately parallel to each other,

or

$40 \leqq R_e(A) \leqq 210$,

$-105 \leqq R_{th}(A) \leqq -20$,

$130 \leqq R_e(B) \leqq 230$ and

$-150 \leqq R_{th}(B) \leqq -65$,

wherein the parameters in the formula are as defined in Claim 1.

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[1] Herein the following abbreviations are used for convenience:

ABSNAX: Absorption slow axis

ANISOTROPIC: Optically anisotropic member

LC: Liquid crystal

LCC: Liquid crystal cell

PI: Polarizer at incident side

PO: Polarizer at output side

Applicants respectfully submit that the presently claimed liquid crystal display device of Independent Claim 1 is neither taught, suggested, nor factually provides support yielding predictable results; that would have been obvious to one of ordinary skill in the art, in view of Itakura et al.

Itakura et al. disclose:

> [A]n in-plane switching active matrix liquid crystal display with greater improvements on color shifting and contrast. The liquid crystal display device comprises an in-plane switching type liquid crystal panel having an active device substrate, an opposing substrate and a liquid crystal layer held sandwiched between the active device substrate and the opposing substrate, a first polarizer laid out on one side of the liquid crystal display panel, a second polarizer laid out on the opposite side of the liquid crystal display panel, first to third optical compensators placed in order between the liquid crystal display panel and the first polarizer, and a fourth optical compensator placed between the liquid crystal display panel and the second polarizer." (ABSTRACT of Itakura et al.)

In Itakura et al., four embodiments with some examples are disclosed. Of these embodiments, only the fourth embodiment of Itakura et al. is similar to the presently claimed invention in that two optical compensators are disposed separately between the liquid crystal cell and the polarizer at the incident side and between the liquid crystal cell and the polarizer at the output side. However, Itakura et al. fail to disclose that the retardations (nx-ny)d of the compensators which correspond to Re(A) and Re(B) in the present Claim 1 should satisfy the following formula:

$$40 \leqq R_e(A) \leqq 210,$$

$$-105 \leqq R_{th}(A) \leqq -20,$$

$$130 \leqq R_e(B) \leqq 230 \text{ and}$$

$$-150 \leqq R_{th}(B) \leqq -65.$$

Itakura et al. disclose in EXAMPLE 1 OF FOURTH EMBODIMENT that the retardation (nx-ny)d of the first compensator which corresponds to Re(A) of the present invention is set equal to 412 nm (column 14, lines 53 to 54) and the retardation (nx-ny)d of the second compensator which corresponds to Re(B) of the present invention is set equal to -320 nm

(column 14, lines 58 to 59). Itakura et al. disclose also that in EXAMPLE 2 OF FOURTH EMBODIMENT that the retardation (nx-ny)d of the first compensator which corresponds to Re(A) of their invention is set equal to 402 nm (column 15, lines 11 to 12) and the retardation (nx-ny)d of the second compensator which corresponds to Re(B) of their invention is set equal to -186 nm (column 15, lines 15 to 16). As defined in present Claim 1, n_{xA} and n_{xB} are the refractive indices in a direction of in-plane slow axis. Therefore, in the present Claim 1, there is not a possibility that the values, n_{xA}-n_{yA} or n_{xB}-n_{yB} are negative.

In contrast, Itakura et al. do not specifically define that the direction of nx is a direction of an in-plane slow axis of an anisotropic member. When the value, nx-ny of optical compensator of Itakura et al. is negative, it means that the in-plane slow axis of the compensator is in the direction of ny instead of nx. Therefore, when (nx-ny)d is a negative value in Itakura et al., the in-plane retardation Re as defined in the present invention can be calculated by the following equation:

Re = (ny.nx)d.

Stated differently, a retardation, (nx-ny)d having a negative value in Itakura et al. can be converted to the in-plane retardation (Re(A) or Re(B)) as defined in present Claim 1 by deletion of minus sign (i.e., by taking the absolute value of the number). The values of (nx-ny)d disclosed in both examples of FOURTH EMBODIMENT of Itakura et al. or (ny-nx)d converted to a positive value do not satisfy the requirement of Re(A) and Re(B) simultaneously as defined in present Claim 1. Thus, Itakura et al. fail to teach, suggest, or yield predictable results from a finite number of identified directions of nx with regards to one of the important features of Claim 1.

Furthermore, although Itakura et al. teach a relation of directions of refractive indices nx of the first and the second optical compensators with a direction of liquid crystal layer (please see column 4, lines 29 to 47, FIG. 21B and column 14, lines 48 to 62 of Itakura et al.), Itakura et

al. fail to teach, suggest, or provide predictable guidance, to specifically a relation between the directions of in-plane slow axes of the first and the second optical compensators. It is noted here that the arrow lines in optical compensators in Itakura et al. show the direction of the refractive index nx, but this direction is not necessarily the same as the direction of the in-plane slow axis of the optical compensators. In fact, when nx-ny<0 in an optical compensator, the direction of in-plane slow axis of the optical compensator is perpendicular to the direction of the direction of refractive index. Itakura et al. disclose that the retardations (nx-ny)d of first optical compensators 71 in Examples 1 and 2 of FOURTH EMBODIMENT are 412 nm (column 14, line 54) and 402 nm (column 15, lines 11 to 12), respectively, and the second optical compensators 72 in Examples 1 and 2 of FOURTH EMBODIMENT are -320 nm (column 14, lines 58 to 59) and -186 nm (column 15, lines 15 to 16), respectively. Namely, the direction of the in-plane slow axis of the optical compensator 71 in both of Examples 1 and 2 of FOURTH EMBODIMENT is the same as the direction of the refractive index nx in the first optical compensator 71 as shown by the arrow line in FIG. 21B, while the direction of the in-plane slow axis of the optical compensator 72 in both of Examples 1 and 2 of FOURTH EMBODIMENT is perpendicular to the direction of the refractive index nx in the first optical compensator 72 as shown by the arrow line in FIG. 21B. Stated differently, the direction of the in-plane slow axis of the second optical compensator 72 is parallel to the direction of the in-plane slow axis of the first optical compensator 71 in Itakura et al. in their fourth embodiment (please see also page 4, lines 3 to 9 of the DECLARATION UNDER 37 CFR 1.132 attached hereto). In contrast, the in-plane slow axes of optically anisotropic members (A) and (B) should be perpendicular in presently claimed invention as recited in Claim 1. Thus, Itakura et al. fail to teach or provide predictable guidance to at least two important features of the present Claim 1. It is therefore submitted that one of ordinary skill in the art could not have predictably achieved the claimed invention from the teaching and guidance of Itakura et al.

In addition to the arguments set forth above, Mr. Mitsuhito Hirota of the assignee conducted a supplemental experiment by computer simulation in order to prove the unexpected result of the presently claimed invention as recited Claim 1, described in the attached DECLARATION UNDER 37 CFR 1.132.

Before comparing the disclosure of Itakura et al. and the subject matter of the presently claimed invention, it is necessary to confirm the difference in the parameters disclosed in Itakura et al. and those of presently claimed invention, particularly with respect to the direction of in-plane slow axis, and the value of retardation in the direction of thickness. As discussed above, Itakura et al. do not specifically define the direction of in-plane slow axis of the optical compensators, nor provides guidance from a finite number of identified, predictable methods, with a reasonable expectation of success. Therefore, retardations (nx.ny)d having a negative value should be converted to a positive value by deletion of minus sign. Another difference in defining a parameter is a manner of defining the value of retardation in the direction of thickness. In the present invention, the retardation in the direction of thickness, $R_{th}(A)$ and $R_{th}(A)$ are defined as follows:

$R_{th}(A) = [(n_{xA} + n_{yA})/2 - n_{zA}] \times d_A$ and

$R_{th}(B) = [(n_{xB} + n_{yB})/2 - n_{zB}] \times d_B$.

In Itakura et al., however, another parameter: (nx-nz)/(nx-ny) is defined instead of $R_{th}(A)$ and $R_{th}(B)$ in the present Claim 1. For convenience, this parameter defined by Itakura et al. is referred to herein as "Nz", namely:

$Nz = (nx-nz)/(nx-ny)$.

However, these parameters $R_{th}(A)$ or $R_{th}(B)$ and Nz can easily be converted mathematically to each other by the following relations:

$Nz= (nx-nz)/(nx-ny) = (R_{th} / R_e)+0.5$ or

$R_{th} = R_e(Nz-0.5)$

by abbreviating suffixes A or B in R_{th} and R_e, when (nx-ny) is positive. It is further noted in Itakura et al. where nx-ny < 0 whereas n_{xA}-n_{yA} or n_{xB}-n_{yB} is always positive in the present Claim 1. When nx-ny < 0, the direction of ny is a direction of in-plane slow axis. Therefore, in order to calculate R_{th} corresponding to the definition of the present Claim 1 from Nz value disclosed in Itakura et al, above equation should be rewritten by replacing nx with ny and ny with nx, respectively, and it follows through a simple mathematical conversion that

$Nz' = (ny-nz)/(ny-nx) = 1 - Nz$ or

$R_{th}' = R_e' (0.5-Nz)$

wherein Nz' represents converted value calculated from nx-ny and Nz in Itakura et al., R_{th}' represents the converted value of retardation in the direction of thickness and R_e'=-(nx-ny).

In the Supplemental Experiments, omni-directional contrast of the liquid crystal display devices of Examples 8 to 11 of the Supplemental Experiment and of Example 1 of the original specification having parameters which are within the scope of present Claim 1 (the third embodiment of the present invention) were obtained by computer simulation and the results were summarized in Table 1. As attained from the data in Table 1, the omni-directional contrast of the liquid crystal devices satisfying the requirement of present Claim 1 was from >150 to >20. Table 2 shows data obtained in Comparative Example 2 by a computer simulation conducted based on essentially same conditions as that shown in Table 1 for the liquid crystal display of the FOURTH EMBODIMENT disclosed in Itakura et al. which is similar to the embodiment of the presently claimed invention. Namely the third embodiment of the present invention in that two optical compensators are disposed separately between the liquid crystal cell and the polarizer at the incident side and between the liquid crystal cell and the polarizer at the output side. The omni-directional contrast ratio obtained showed >10 which is remarkably inferior as compared to the value from >150 to >20 in Examples 8 to 11 of the Supplemental Experiment and of Example 1 of the present specification as set forth above. To one of ordinary skill in the art,

such difference in omni-directional contrast ratio is considered to be distinguishable evidence showing the prominent, unexpected advantage of the presently claimed invention over Itakura et al.

In summary, the presently claimed invention is not rendered obvious by Itakura et al. As such, withdrawal of the rejections is respectfully requested.

CONCLUSION

Examiner noted that the prior art of record was considered pertinent to Applicants' disclosure. Applicants have reviewed the prior art of record and submit it does not adversely bear on the patentability of the pending claims.

In light of the foregoing, Applicants respectfully submit that each and every item presented by the Examiner in this Office Action has been addressed. Favorable reconsideration of all of the claims as amended is earnestly solicited. Applicants submit the present application, with the foregoing claim amendments and accompanying remarks, is in a condition for allowance and respectfully request such allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen Reg. No. 43,575 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

Dated: May 19, 2008

Respectfully submitted,

By Gerald M. Murphy, Jr. #28977

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Attachment: Declaration under 37 CFR 1.132 (5 pages)